

CLAIMS

I- A compound selected from those of formula (I) :



wherein :

5 p represents an integer of from 0 to 6 inclusive,

n represents an integer of from 0 to 6 inclusive,

R₁ and R₂, which may be identical or different, each independently of the other represent a group selected from hydrogen, linear or branched (C₁-C₆)alkyl, aryl, and aryl-(C₁-C₆)alkyl in which alkyl is linear or branched, or R₁+R₂ form together with nitrogen carrying them saturated, 3- to 10-membered, monocyclic, or bicyclic system, optionally containing second hetero atom selected from oxygen, nitrogen, and sulphur,

X represents a group selected from oxygen, sulphur, -CH=CH-, methylene, a group of formula -HC=N-O- and a group of formula -O-CH₂-CH=CH-, in which groups oxygen is linked to Y of the compounds of formula (I),

Y represents a group selected from aryl, heteroaryl, aryl-(C₁-C₆)alkyl in which alkyl moiety is linear or branched, heteroaryl-(C₁-C₆)alkyl in which alkyl is linear or branched, -C(O)-A, and -C(S)-A,

A represents a group selected from linear or branched (C₁-C₆)alkyl, aryl, heteroaryl, aryl-(C₁-C₆)alkyl in which alkyl is linear or branched, heteroaryl-(C₁-C₆)alkyl in which alkyl is linear or branched, and NR₃R₄ wherein R₃, and R₄, which may be identical or different, each represent a group selected from hydrogen, linear or branched (C₁-C₆)alkyl, aryl, and aryl-(C₁-C₆)alkyl in which alkyl is linear or branched, or R₃+R₄ form together with nitrogen carrying them monocyclic, or bicyclic (C₃-C₁₀) system,

its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base,

25 with the proviso that :

* in the case of 1,1-disubstituted compounds of formula (I),

- p is other than zero, when X represents methylene, n has the value zero, Y represents

aryl, or heteroaryl, and R₁, and R₂, which may be identical or different, represent hydrogen, linear or branched (C₁-C₄)alkyl, benzyl, phenylethyl, or form together with nitrogen carrying them morpholino, thiomorpholino, or 5- to 7-membered saturated carbocyclic system,

- 5 - p is other than zero, when X represents methylene, n has the value zero, Y represents acetyl, and R₁, and R₂, which may be identical or different, represent hydrogen, linear or branched (C₁-C₄)alkyl, phenyl, benzyl, or form together with nitrogen carrying them piperidyl, or morpholino,
- R₁, and R₂ do not simultaneously represent methyl:

* either, when p, and n each have the value 1, X represents oxygen, and Y represents selected from p-nitrobenzoyl, p-aminobenzoyl, p-chlorophenylaminocarbonyl, and acetyl,

* or, when p has the value zero, n has the value 1, X represents oxygen, or sulphur, and Y represents 2-quinolyl substituted in the 3-position by linear or branched (C₃-C₄)alkyl, or phenyl,

- Y does not represent 1,2-benzisoxazol-3-yl when n has the value 1, p has the value zero, and X represents oxygen,

• *in the case of 1,2-disubstituted compounds of formula (I),*

- R₁, and R₂ do not simultaneously represent hydrogen when p, and n each have the value zero, and X-Y together represent phenoxy (optionally substituted by one or two, identical or different, groups selected from methoxy, dimethylamino, halogen, methyl, trifluoromethyl, nitro, and amino), phenylsulphanyl, benzyloxy, benzyl group, or 2-phenylethyl,

- R₁ and R₂ do not simultaneously represent methyl when p, and n each have the value zero and X-Y together represent phenoxy (optionally substituted by a group selected from chlorine, and trifluoromethyl), phenylsulphanyl, or benzyl,

and also with the proviso that the compounds of formula (I) are other than the following compounds :

- (1-benzylcyclopropyl)methanamine,
- (1-benzylcyclopropyl)-N,N-dimethylmethanamine,

- 2-(phenoxy)cyclopropyl)methanamine,
- 2-(phenoxyethyl)-cyclopropanamine,
- (N,N-dimethyl)-2-(acetoxymethyl)-cyclopropanemethanamine,
- N-{2-[2-(benzyloxy)ethyl]cyclopropyl}-N,N-dimethylamine.

5 it also being understood that :

- aryl denotes phenyl, biphenyl, naphthyl, dihydronaphthyl, tetrahydronaphthyl, indanyl, or indenyl, each of those groups being optionally substituted by one or more, identical or different, groups selected from halogen, linear or branched (C₁-C₆)alkyl, hydroxy, cyano, nitro, linear or branched (C₁-C₆)alkoxy, linear or branched (C₂-C₇)acyl, linear or branched (C₁-C₆)alkoxycarbonyl, linear or branched (C₁-C₆)trihaloalkyl, linear or branched (C₁-C₆)trihaloalkoxy, and amino optionally substituted by one or two linear or branched (C₁-C₆)alkyl,
- heteroaryl denotes 5- to 12-membered, monocyclic aromatic or bicyclic system containing from one to three, identical or different, hetero atoms selected from oxygen, nitrogen and sulphur, one of the rings of which, in the case of bicyclic system, is aromatic in character, and the other ring of which may be aromatic, or partially hydrogenated, each of those groups being optionally substituted by one or more, identical or different, groups selected from substituents defined hereinbefore for aryl.

2- A compound of claim 1, characterised in that n is an integer of from 0 to 2 inclusive, its
20 isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

3- A compound of claim 1, characterised in that R₁, and R₂, which may be identical or different, each represent hydrogen, or linear or branched (C₁-C₆)alkyl, its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

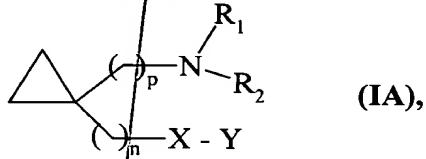
4- A compound of claim 1, characterised in that X represents oxygen, its isomers and
25 addition salts thereof with a pharmaceutically-acceptable acid or base.

5- A compound of claim 1, characterised in that Y represents a group selected from

-C(O)NR₃R₄ wherein R₃, and R₄, are as defined for formula (I), acetyl, -C(O)-heteroaryl, aryl-(C₁-C₆)alkyl in which alkyl is linear or branched, and heteroaryl, its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

5 6- A compound of claim 1, characterised in that Y represents pyridyl, its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

7- A compound of claim 1, characterised in that it represents a compound of formula (IA) :



wherein n, p, X, Y, R₁ and R₂ are as defined for formula (I), its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

10 8- A compound of claim 1, characterised in that it represents a compound of formula (IB) :



wherein n, p, X, Y, R₁, and R₂ are as defined for formula (I), its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

15 9- A compound of claim 1, characterised in that p is an integer having the value 0 or 1, its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

20 10- A compound of claim 8, characterised in that p represents 0, or 1, n represents 0, or 1, R₁ and R₂, which may be identical or different, represent hydrogen, or linear or branched (C₁-C₆)alkyl, X represents oxygen, and Y represents a group selected from phenyl-(C₁-C₆)alkyl in which alkyl is linear or branched, pyridyl, and -C(O)-A wherein A represents linear or branched (C₁-C₆)alkyl, mono(C₁-C₆)alkylamino, or di(C₁-C₆)alkylamino, alkyl being linear or branched, its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

11- A compound of claim 7, characterised in that p represents 0, or 1, n is an integer of from 0 to 3 inclusive, R₁ and R₂, which may be identical or different, represent hydrogen, linear or branched (C₁-C₆)alkyl or form together with nitrogen carrying them, pyrrolidinyl group, X represents oxygen, sulphur or -CH=CH-, and Y represents a group selected from phenyl (optionally substituted by hydroxy, linear or branched (C₁-C₆)alkyl or halogen), pyridyl, pyridyl-(C₁-C₆)alkyl in which alkyl is linear or branched (pyridyl in each of those groups being optionally substituted by a group selected from halogen, and linear or branched (C₁-C₆)alkyl), and -C(O)-A wherein A represents a group selected from linear or branched (C₁-C₆)alkyl, linear or branched mono(C₁-C₆)alkylamino, linear or branched di(C₁-C₆)alkylamino, and pyridyl, its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

12- A compound of claim 1, which is :

- 2-[1-(dimethylamino)cyclopropyl]ethyl methylcarbamate,
- 2-[1-(dimethylamino)cyclopropyl]ethyl dimethylcarbamate,
- [1-(dimethylamino)cyclopropyl]methyl dimethylcarbamate,
- [1-(dimethylamino)cyclopropyl]methyl acetate,
- 2-[1-(dimethylamino)cyclopropyl]ethyl acetate,
- 1-[(dimethylamino)methyl]cyclopropyl acetate,
- [1-(dimethylamino)cyclopropyl]methyl nicotinate,
- N,N-dimethyl-1-[(3-pyridyloxy)methyl]cyclopropanamine,
- N-methyl-1-[(3-pyridyloxy)methyl]cyclopropanamine,
- N,N-dimethyl-1-[(3-pyridylmethoxy)methyl]cyclopropanamine,
- N,N-dimethyl-1-[2-(3-pyridyloxy)ethyl]cyclopropanamine,
- 4-({2-[1-dimethylamino)cyclopropyl]ethyl}sulphanyl)phenol,
- (±)-*cis*-2-(dimethylamino)cyclopropyl methylcarbamate,
- (±)-*trans*-2-(dimethylamino)cyclopropyl methylcarbamate,
- (±)-*cis*-2-(dimethylamino)cyclopropyl acetate,
- (±)-*trans*-2-(dimethylamino)cyclopropyl acetate,
- (±)-*cis*-2-(dimethylamino)cyclopropylmethyl acetate,
- (±)-*trans*-2-(dimethylamino)cyclopropylmethyl acetate,

- (±)-*cis*-2-[(benzyloxy)methyl]-*N,N*-dimethylcyclopropanamine,
- (±)-*trans*-2-[(benzyloxy)methyl]-*N,N*-dimethylcyclopropanamine,
- (±)-*trans*-2-[(dimethylamino)methyl]cyclopropyl acetate,
- 1-[(3-pyridyloxy)methyl]cyclopropanamine dihydrochloride,
- 5 ▪ *N*-methyl-1-{[(6-methyl-3-pyridyl)oxy]methyl}cyclopropanamine hydrochloride,
- *N*-methyl-1-{[(6-chloro-3-pyridyl)oxy]methyl}cyclopropanamine hydrochloride,
- *N*-{1-[(3-fluorophenoxy)methyl]cyclopropyl}-*N*-methylamine hydrochloride,
- 3-[1-(dimethylamino)cyclopropyl]propyl dimethylcarbamate fumarate,
- 3-[1-(dimethylamino)cyclopropyl]propyl methylcarbamate fumarate,
- *N*-methyl-1-[(2-pyridylsulphanyl)methyl]cyclopropanamine dihydrochloride,
- *N*-methyl-1-[3-(3-pyridyloxy)propyl]cyclopropanamine dihydrochloride,
- *N*-methyl-1-[2-(3-pyridyl)ethyl]cyclopropanamine dihydrochloride,
- *N*-methyl-1-[(Z)-2-(3-pyridyl)ethenyl]cyclopropanamine fumarate,
- [1-(1-pyrrolidinyl)cyclopropyl]methyl dimethylcarbamate fumarate,
- *N,N*-dimethyl-1-[2-(3-pyridyl)ethyl]cyclopropanamine hydrochloride,
- 3-{{[1-(1-pyrrolidinyl)cyclopropyl]methoxy}pyridine fumarate,
- *N*-methyl-1-[2-(3-pyridyloxy)ethyl]cyclopropanamine fumarate,
- 2-[1-(methylamino)cyclopropyl]ethyl dimethylcarbamate hydrochloride, and
- 2-[1-(1-pyrrolidinyl)cyclopropyl]ethyl dimethylcarbamate fumarate,

20 its isomers and addition salts thereof with a pharmaceutically-acceptable acid or base.

13- A method for treating a living body afflicted with a disease where specific nicotinic ligand of $\alpha_4\beta_2$ receptors is involved, comprising the step of administering to the living body an amount of a compound of claim 1 which is effective for alleviation of said conditions.

25 ✓ 14- A method for treating a living body afflicted with deficiencies of memory associated with cerebral ageing and with neurodegenerative disease, or with a disease like mood disorders, Tourette's syndrome, hyperactivity syndrome with attention-deficit, tobacco withdrawal, or pain, comprising the step of administering to the living body an amount of a compound of claim 1 which is effective for alleviation of said conditions.

5 15- A method for treating a living body afflicted with deficiencies of memory associated with Alzheimer's disease, Parkinson's disease, Pick's disease, Korsakoff's disease, or frontal lobe and subcortical dementias, comprising the step of administering to the living body an amount of a compound of claim 1 which is effective for alleviation of said conditions.

16- A pharmaceutical composition useful as specific nicotinic ligand of $\alpha_4\beta_2$ receptors, comprising as active principle an effective amount of a compound as claimed in claim 1, alone or in combination with one or more pharmaceutically-acceptable excipients or carriers.

17- A pharmaceutical composition useful in the claim 14 method comprising as active principle an effective amount of a compound as claimed in claim 1, together with one or more pharmaceutically-acceptable excipients or vehicles.

18- A pharmaceutical composition useful in the claim 15 method comprising as active principle an effective amount of a compound as claimed in claim 1, together with one or more pharmaceutically-acceptable excipients or vehicles.

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